

Utility Interconnection Equipment Certification

The information on this form is provided to indicate the compliance of the generation equipment listed below with the utility interconnection certification requirements defined in California PUC Electric Rule 21.

Certifying Laboratory(s) *The information on this form is provided by the following Nationally Recognized Test Laboratory:*

Laboratory: Underwriters Laboratories Inc.

Contact Name: Adalberto Margarito Phone: 408-985-2400 x32341

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Address: 1655 Scott Blvd.

City: Santa Clara State: CA Zip: 95050

Accredited by: Underwriters Laboratories Inc. Date: _____

Accredited to (test standards)¹: UL1741

Laboratory: Nemko/EESI

Contact Name: Ricky Hill Phone: 818-700-5300

Email: ricky.hill@nemkona.com

Address: 9604 Variel Ave.

City: Chatsworth State: CA Zip: 91311

Accredited by: Nemko Date: _____

Accredited to (test standards)¹: IEEE C62.41/C62.45

Equipment Specification *The information on this form applies to the following equipment:*

Equipment Manufacturer: Capstone Turbine Corp.

Address: 21211 Nordhoff St.

City: Chatsworth State: CA Zip: 91311

Model Number(s): Model 60

Software Version(s): 3.10 – 3.99

Effective²: November 15, 2001

Device Description³: 60 kW microturbine generator with integral protective relay functions

Test Results⁴

Mark the box next to each requirement that has been met and each test that has been performed and successfully passed. Provide an explanation of any exceptions or omissions on a separate sheet. List additional test documents used on a separate sheet.

UL 1741: (Section number listed)

☒ - 39 ☐ - 40.1 ☒ - 41.2 ☒ - 44 ☒ - 45.2.2 ☒ - 45.4 ☒ - 45.5
☒ - 46.2 ☒ - 46.2.3 ☒ - 46.4 ☒ - 47.3 ☐ - 47.7 *Optional:* ☒ - 46.3

☒ - IEEE/ANSI C62.45/C62.41 (location Category B3) (testing conducted by Nemko)

California Rule 21: ☐ - J.3.e Non-export ☒ - J.3.f In-Rush Current ☐ - J.3.h Synchronization

Device Rating⁵: Power Output - 60 kW, 83 kVA, 100 A per phase; Voltage - 400 – 480 VAC;

Frequency - 50/60 Hz; Phase – 3

Maximum Available Fault Current, A: 70 A

In-rush current⁶, A: 47 A

Trip settings⁷:

Protective Function		Test Voltage(s) or Frequency(s)/Time Delay	Factory Settings ⁸ And Adjustable Range
Fast Over Voltage	Setting	531 V – 534 V/30 ms	600 V/30 ms delay
	Measured Trip Time	32.0 ms – 34.0 ms	OV – 600 V/0.001 s – 1.000 s
Over Voltage	Setting	520 V – 528 V/1.9 s	524 V/1.9 s delay
	Measured Trip Time	1.89 s – 1.99 s	UV – 528 V/0.01 s – 10.00 s
Under Voltage	Setting	428 V – 416 V/1.9 s	428 V/1.9 s delay
	Measured Trip Time	1.89 s – 1.91 s ms	OV – 360 V/0.01 s – 10.00 s
Fast Under Voltage	Setting	355 V – 330 V/95 ms	264 V/95 ms delay
	Measured Trip Time	88.0 ms – 99.0 ms	UV – 0 V/0.001 s – 1.000s
Over Frequency	Setting	60.4 Hz – 60.6 Hz/90 ms	60.5 Hz/90 ms delay
	Measured Trip Time	74.0 ms – 87.0 ms	UF – 65.0 Hz/0.01 s – 10.00 s
Under Frequency	Setting	59.4 Hz – 59.2 Hz/90 ms	59.3 Hz/90 ms delay
	Measured Trip Time	72.0 ms – 85.0 ms	OF – 45.0 Hz/0.01 s – 10.00 s

Nominal Power Factor (Range, if adjustable): 1.0

Non-Islanding: Yes x No _____ Maximum Trip Time: 345 ms

Non Export: Yes _____ No x Method: _____

Other⁹: _____

NOTES

- 1 Accreditation must apply to test standards listed herein.
- 2 Note here the date of certification, applicable serial number (range or first in series), or other information that indicates which units the certification applies to.
- 3 List appropriate functions, capabilities, applications, limitations, etc. Use additional sheets as necessary.
- 4 List all test documents (i.e. UL 1741, IEEE C62.45) and specific procedures (i.e. UL 1741 Sec 39.1 – 39.5, etc.) used to evaluate device's suitability for utility interconnection.
- 5 kW, kVA, V, A, etc. as appropriate.
- 6 For devices that use grid power to motor to speed.
- 7 Trip Value (Voltage in volts or frequency in Hz) and timing (in cycles). Devices with adjustable settings shall provide test results over the range of settings. For each test setting provide the setting values in the upper box and measured results in the lower box. List device ranges, if adjustable.
- 8 Note standard factory settings. Provide Voltage/Timing or Frequency/Timing.
- 9 Provide any additional information that may be useful in evaluating these results such as test configurations, device settings used to meet requirements, etc. Use additional sheets if necessary.

Addendum to Test Results

UL1741 Exceptions:

Section 40.1 – This section is specifically intended for photovoltaic arrays, and as such is not applicable to the microturbine.

Section 47.7 – The microturbine does not have a bypass switch, and therefore this test is not applicable.